DENTAL ADHESIVE COATING BASE COMPOSITION AND ORAL COMPOSITION

This is a Continuation of application Ser. No. 07/360,694 filed Jun. 2, 1989 which is a Continuation-In-Part of application Ser. No. 07/122,801 abandoned.

FIELD OF THE INVENTION

The present invention relates to a novel dental adhesive coating base composition exhibiting good adhesion to the teeth, as well as an oral composition capable supplying fluorine to the teeth.

BACKGROUND OF THE INVENTION

Fluorine has been known as a substance which acts on the teeth to enhance the acid-resistance of the enamel, thereby reducing the incidence of dental caries. Conventionally, fluoride compounds such as sodium fluoride, stannous fluoride, and sodium monofluorophosphate are incorporated as fluorine sources in various oral compositions such as dentifrices, mouthrinses, and coating agents in such a way that they act on the surface of teeth, thereby allowing fluorine to exhibit its dental caries preventing effects.

Recent studies have reported that fluorine treatment applied in the early stage of dental caries accelerates remineralization, i.e., restoration of affected teeth to sound ones.

Fluorine-containing dentifrices, mouthrinses, and coating agents have the advantage of easy applicability but their retention in the mouth is not satisfactorily long and the period of time over which fluorine acts on the teeth is insufficiently short. Thus, the uptake of fluorine by the teeth is not high enough to warrant the intended efficacy. Since conventional dental caries-preventing fluorine coating agents employ water-soluble fluorides and are usually formulated in water-soluble dosage forms, they are unable to be retained in the mouth for a satisfactorily long period of time.

Methods have been attempted to improve the oral retention of fluorides by using thickening or gelling water-soluble high molecular weight compounds or by dispersing the fluoride in natural resins, but even such modified agents are unable to be retained in the mouth no more than several hours.

Methyl methacrylate based polymers and bis-GMA based polymers have been known for use as dental compositions such as fissure sealants and dental adhesives. These polymers are used after polymerization and curing having taken place in the mouth, such as by polymerization at ambient temperatures in the presence of benzoyl peroxide or tertiary amines, or by polymerization reaction initiated by ultraviolet or visible ray. In such in situ polymerization methods, some monomers will inevitably remain unreacted and cause deleterious effects to the patient. Furthermore, their applicability is poor because two pastes have to be mixed together or exposure to light is necessary to initiate the polymerization reaction. In addition to this poor applicability, the monomers are so unstable that they have a tendency to become sticky or solidify during prolonged storage, thereby failing to warrant the quality of the product.

SUMMARY OF THE INVENTION

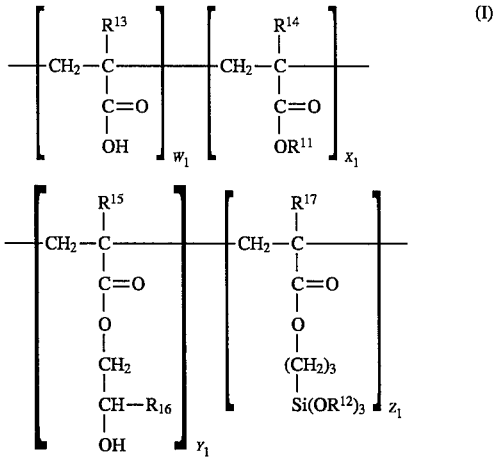
An object of the present invention is to provide a dental adhesive coating base composition which is free from the aforementioned problems of the prior art and which exhibits markedly strong adhesion to the surfaces teeth.

Another object of the present invention is to provide an oral composition which attains markedly strong adhesion to the tooth surfaces and which permits fluoride ions to act on the teeth for a satisfactorily extended period of time.

These and other objects of the present invention will become apparent from the following description.

In order to attain the above objects, the present inventors have conducted intensive studies and have accomplished the present invention.

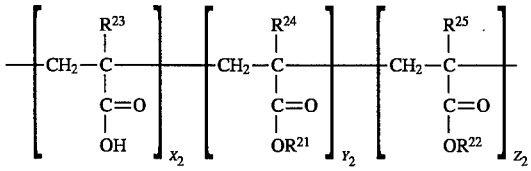
In one aspect, the present invention provides a dental adhesive coating base composition comprising a copolymer represented by formula (I) in an amount of from 5 to 40 wt % based on the total amount of the composition:



(I)

wherein R^{11} represents an alkyl group having from 1 to 10 carbon atoms; R^{12} represents a lower alkyl group having from 1 to 2 carbon atoms, provided that three R^{12} groups must be the same; R^{13}, R^{14}, R^{15}, R^{16} and R^{17}, which may be the same or different, each represents a hydrogen atom or a methyl group; W_1 is from 5 to 30 wt %; X_1 is from 20 to 60 wt %; Y_1 is from 20 to 60 wt %; and Z_1 is from 0.2 to 20 wt %. Each repeating unit in formula (I) may be composed of two or more kinds of repeating units.

In another aspect, the present invention provides a dental adhesive coating base composition comprising a copolymer represented by formula (II) in an amount of from 5 to 40 wt % based on the total amount of the composition:



(II)

wherein R^{21} and R^{22}, which may be the same or different, each represent an alkyl group having from 1 to 10 carbon atoms; R^{23} R^{24} and R^{25} which may be the same or different, each represent a hydrogen atom or a methyl group, provided that at least one of the groups R^{21} and R^{22}, and R^{24} and R^{25}, respectively, are different from each other; X_2 is from 5 to 80 wt % Y_2 is from 10 to 95 wt % and Z_2 is from 0 to 85 wt %. Each repeating unit in formula (II) may be composed of two or more kinds of repeating units.

In a further aspect, the present invention provides an oral composition comprising at least one of a copolymer represented by formula (I) and a copolymer represented by formula (II) in an amount of from 5 to 40 wt % based on the total amount of the composition; at least one of a phosphoric